

# "CONCRETE & CONSTRUCTIONAL ENGINEERING"

VOL. LVI

FIFTY-SIXTH YEAR OF PUBLICATION

1961

CONCRETE PUBLICATIONS, LTD., 14 DARTMOUTH STREET, LONDON, S.W.1.

## INDEX

|   |          |
|---|----------|
| Accidents in the constructional industries ..         | 303      |
| Aggregate in concrete for marine works, Gap-graded .. | 326      |
| Aggregates, Electrical heater for ..                  | 443      |
| " Production of ..                                    | 343      |
| " Revised British standard for testing ..             | 44       |
| Architectural award, An ..                            | 323      |
| congress ..   | 166, 306 |

### AUTHORS:

|  |               |
|--|---------------|
| Baker, A. L., on A general equation for frame analysis ..  | 97, 160, 433  |
| Bennett, J. D., on The design of eccentrically loaded circular columns by the load-factor method 71, 111, 187 .. | 335           |
| Davies, J. D., on Bending moments on long rectangular tanks on elastic foundations ..                            | 315           |
| Erdel, C., on The shearing resistance of beams by the load-factor method ..                                      | 379           |
| Faber, J., on A bridge in Northern Ireland ..  | 57            |
| Hewlett, P. M., on Position of planes of contraflexure due to wind on multiple-storey buildings ..               | 239           |
| Müller, L. S., on Balcony slabs spanning in two directions ..  | 153           |
| Ormerod, A., on Moment-distribution factors for members with change of cross-section ..                          | 301           |
| Pocologasundram, K., on The analysis of three-bay frames by the plastic-hinge method ..                          | 247, 267, 323 |
| Rygal, J., on A practical comprehensive method of designing reinforced concrete sections ..                      | 371, 423      |
| Scriven, W. E., on Forces in three-dimensional groups of piles ..  | 397           |
| Szeginer, Yükeel, The design of doubly-reinforced flanged beams by the load-factor method ..                     | 141, 246      |
| Staszewski, K., on Analysis of frames with V-supports ..   | 349           |
| Steedman, J. C., Nomograms for beams with compression reinforcement ..   | 175, 401      |
| Stephenson, D. A., on Effects of differential temperature on tall slender columns ..                             | 325           |
| Avalanche sheds, Concrete ..   | 45            |
| Balloon-vault roof of Ashington technical college ..   | 326           |
| Batching concrete materials, Bags for ..   | 307           |
| Beams by the load-factor method, The design of doubly-reinforced flanged, by Yükeel Szeginer ..                  | 315           |
| " The shearing resistance of, by C. Erdel ..   | 200, 327      |
| " Standard prestressed ..  | 349           |
| " with compression reinforcement, Nomograms for, by J. C. Steedman ..  | 324           |

### BOOK REVIEWS:

|   |        |
|---|--------|
| Architects' Detail Sheets, edited by E. D. Mills ..   | 118    |
| Bauen mit Stahlbetonfertigteilen, by L. Mokk ..   | 422    |
| Beton-Kalender 1961 ..  | 420    |
| Betonkorrosion-Betonenschutz, by I. Bizcók ..   | 268    |
| Building Construction Estimating, by G. H. Cooper ..  | 4, 422 |
| Building Technicians' Pocket Diary ..   | 56     |
| Can Man Plan? by F. J. Osborn ..  | 140    |
| Concrete Engineering Handbook. Edited by W. S. Londe and M. F. James ..                               | 348    |
| Concrete Technology, by F. S. Fulton ..   | 420    |
| Deep Foundations and Sheet-piling, by D. H. Lee ..  | 421    |
| Design and Construction of Foundations, by G. P. Manning ..   | 370    |
| Design of Cylindrical Shell Roofs, by J. E. Gibson ..   | 140    |
| Druckfestigkeit von Beton, by K. Walz and H. Schaffer ..  | 348    |
| Eisenpressmörtel für Spannbeton, by W. Albrecht and H. Schmid ..                                      | 324    |
| Elementary Principles of Reinforced Concrete Design, by W. H. Elgar ..                                | 4      |
| Ermittlung Eingeschränkter Plastischer Verformungen, by H. U. Smolitzky ..                            | 324    |
| Failure and Repair of Concrete Structures, by S. Champson ..  | 370    |
| Festigkeit der Biegedruckzone, by Günter Scholz ..  | 261    |
| Foundation Failures, by C. Szechy ..  | 421    |
| Frame Analysis, by A. S. Hall and R. W. Woodhead ..   | 208    |
| Frames and Arches, by V. Leontovich ..  | 56     |
| Gas- und Schaumbeton. Verankerung der Bewehrung und Kriechen von bewehrten Platten, by H. Schaffer .. | 238    |
| Geometric Design of Modern Highways, by J. H. Jones ..  |        |

### BOOK REVIEWS (contd.):

|  |             |
|--|-------------|
| Guide to the B.S. Code of Practice for Prestressed Concrete, by F. Walley and S. C. C. Bate ..       | 208         |
| Innovations in Building Materials, by M. Bowley ..   | 324         |
| Kempe's Engineer's Year Book, 1961 ..  | 140         |
| Mechanics of Engineering Soils, by P. L. Capper and W. Fisher Cassie ..                              | 280         |
| Papers Presented at the Third International Congress of the Precast Concrete Industry ..             | 238         |
| Pile Foundations, by R. D. Chellis ..  | 370         |
| Practical Problems in Foundations, by H. R. Reynolds ..  | 56          |
| Prestressed Concrete Cylindrical Tanks, by L. R. Cressy ..   | 348         |
| Prestressed Concrete Simply Explained, by H. Kaylor ..   | 238         |
| Principles of Structural Design, by Niels Liaborg ..   | 421         |
| Production of Non-metallic Aggregates for Concrete, by L. P. Ratkovskii ..                           | 4           |
| Reinforced Concrete, by John Faber and F. Mead ..  | 174         |
| Schubsicherung bei Spannbeton, by H. Rusch and G. Vigerost ..  | 422         |
| Sell's Building and Civil Engineering Trades List ..   | 280         |
| Spannbeton, Theorie und Bemessung, by J. Hahn ..   | 174         |
| Tafeln für Hydrostatisch Belastete Rechteckplatten, by F. Czerny ..                                  | 4           |
| Technology and Properties of Heavy Concrete, by A. E. Desov ..                                       | 118         |
| Versuche über die beim betonieren an den Schalungen, by C. Graff and F. Kaufmann ..                  | 140         |
| Versuche über die Verdichtung, by J. Strey ..  | 140         |
| Box-frame construction in Sweden ..  | 404         |
| Bridge and Structural Engineering, International Assoc. (tion for) ..                                | 396         |
| " at Barking, Widening a ..  | 47          |
| " Cambridge, A prestressed concrete frame ..   | 281         |
| " Gateshead, Reconstruction of a road ..   | 16          |
| " Kuncorn, Pipe ..   | 88          |
| " Forth road, Approach works for, ..   | 169         |
| "     " Content for ..   | 105         |
| "     " The substructure of ..   | 90          |
| " in Germany, A long prestressed ..  | 379         |
| " Northern Ireland, by John Faber ..   | 3           |
| " Queen's, Perth ..  | 199         |
| " S-vern road ..   | 130         |
| " Tamar road, Concrete piers for ..  | 262         |
| " Tay road ..  | 17          |
| Bridges on British Railways, Concrete ..   | 13          |
| " the Ross motorway ..   | 395         |
| " Permissible stresses in road ..  | 200         |
| " Standard beams for prestressed concrete ..   | 361         |
| " Vehicle for testing ..   | 441         |
| British standard for mild steel ..   | 406         |
| "     " ready reckoners ..   | 119         |
| "     " sound insulation and noise reduction ..  | 44          |
| "     " testing aggregates, Revised ..   | 347         |
| "     " testing soils, Revised ..  | 328         |
| "     " notation for concrete structures ..  | 359         |
| Building, A congress ..  | 152         |
| " in London, The highest residential ..  | 48          |
| " Research Board, Investigations by the ..   | 39, 164     |
| Buildings, Position of planes of contraflexure due to wind on multiple-storey, by P. M. Hewlett ..   | 161         |
| Car-parking buildings, Multiple-storey ..  | 429         |
| Cellular concrete in buildings, Reinforced ..  | 147         |
| Cement-mortar construction, Reinforced ..  | 186         |
| Chimney, A prestressed hyperbolic tank on a ..   | 65, 135     |
| " in India, A slender ..   | 71, 11, 187 |
| Church and campanile at Stevengae ..   | 330         |
| Columns, by the load-factor method, The design of eccentrically-loaded circular, by J. D. Bennett .. | 433         |
| " Effects of differential temperature on tall slender, by D. A. Stephenson ..                        | 440         |
| Computer programmes for structural problems ..   | 203         |
| Concrete Structures and Technology course ..   | 29          |
| Construction, Speed of ..  | 339         |
| Construction work, Orders for ..   | 434         |
| Cooling towers, Large ..   |             |
| Decorative concrete: Exposed-aggregate surfaces ..   |             |
| " Patterned surfaces ..  |             |

|  | PAGE         |
|--|--------------|
| Detailing reinforced concrete .. .. .  | 329          |
| Dock in the world, The largest dry .. .. .   | 331          |
| <b>EDITORIAL NOTES:</b>  |              |
| Agriculture and building .. .. .   | 409          |
| Architectural concrete .. .. .   | 333          |
| Architectural congress .. .. .   | 130          |
| Bridge construction in steel and concrete .. .. .  | 95           |
| Building priorities .. .. .  | 410          |
| Concrete and Europe .. .. .  | 367          |
| " Concretor's hands " .. .. .  | 265          |
| Construction costs .. .. .   | 55           |
| Design of reinforced concrete members .. .. .  | 207          |
| Earthquake-resistant construction .. .. .  | 297          |
| Engineers: Qualifications and earnings .. .. .   | 137, 231     |
| Nineteenth-century reinforced concrete tanks .. .. .   | 171          |
| Ready-mixed concrete .. .. .   | 237          |
| Responsibility for constructional costs .. .. .  | 299          |
| Roads and railways .. .. .   | 1            |
| Speed of construction .. .. .  | 205, 433     |
| Statically-indeterminate structures .. .. .  | 93, 433      |
| Structural concrete with light-weight aggregate .. .. .  | 53           |
| Structural safety .. .. .  | 235          |
| Training of operatives and foremen .. .. .   | 172, 293     |
| Exposed-aggregate surfaces, Decorative concrete .. .. .  | 339          |
| Failures of foundations .. .. .  | 261          |
| " Ferro-cement " .. .. .   | 439          |
| <b>FIFTY YEARS AGO:</b>  |              |
| Agricultural products .. .. .  | 332          |
| Arch bridge in Dorset .. .. .  | 46           |
| Chimney constructed with precast units .. .. .   | 104          |
| Coke breeze as aggregate .. .. .   | 151          |
| Concrete construction in the Panama Canal .. .. .  | 232          |
| Destruction of the Austin Dam .. .. .  | 358          |
| Early example of Tilt-up construction .. .. .  | 442          |
| Foundation of reinforced concrete pier at Swanscombe .. .. .   | 195          |
| Gasholder tank .. .. .   | 89           |
| Ornamental concrete stairways .. .. .  | 264          |
| Precast concrete houses .. .. .  | 289          |
| Reinforced concrete helical stairs .. .. .   | 354          |
| Flat-plate construction, Floors of .. .. .   | 290          |
| Flats at Woolwich, Multiple-storey .. .. .   | 290          |
| Floors of Flat-plate construction of .. .. .   | 41           |
| Foremen, Training of operatives and .. .. .  | 293          |
| Foundation, A new type of deep .. .. .   | 91           |
| Foundations, Bending moments on long rectangular tanks on elastic, by J. D. Davies .. .. .               | 335          |
| " Failures of .. .. .  | 261          |
| Frame analysis, A general equation for, by A. L. Baker .. .. .   | 97, 160, 433 |
| Frames by the plastic-hinge method, The analysis of three-bay, by K. Pookagasundram .. .. .              | 301          |
| Frames with V-support, Analysis of, by K. Starzewski .. .. .   | 141, 246     |
| Glass-fibre covering, Sewer pipes .. .. .  | 193          |
| " shuttering for a helical stair .. .. .   | 167          |
| Grandstand at Ascot, The new .. .. .   | 350          |
| Hydro-electric works, A Russian .. .. .  | 264          |
| Insulation and noise reduction, British standard for sound .. .. .                                       | 119          |
| Jacks, Moving forms operated by pneumatic .. .. .  | 360          |
| Jetties at Milford Haven, New .. .. .  | 31           |
| Jetty at Milford Haven, New .. .. .  | 82           |
| Joints in precast members, Tests on .. .. .  | 119          |
| Lift-slab method of construction .. .. .   | 120          |
| Liquid-containing structures, Slabs for .. .. .  | 219          |
| Load-factor method, The design of doubly-reinforced flanged beams by the, Yüsel Sezginer .. .. .         | 397          |
| Load-factor method, The design of eccentrically-loaded circular columns by the, by J. D. Bennett .. .. . | 71, 111, 187 |
| Marine works, Gap-graded aggregate in concrete for .. .. .   | 226          |
| Materials, Bags for batching concrete .. .. .  | 326          |
| Maunell, G. A., The late .. .. .   | 331          |
| Moment-distribution factors for members with change of cross-section, by A. Ormerod .. .. .              | 153          |
| Mortar, Determining the hardness of .. .. .  | 51           |
| Motorway, Bridges on the Ross .. .. .  | 13           |
| " in Italy .. .. .   | 292          |
| Moving forms operated by pneumatic jacks .. .. .   | 360          |
| Nonograms for beams with compression reinforcement, by J. C. Steedman .. .. .                            | 349          |
| Notation for concrete structures, British standard .. .. .   | 328          |
| Nuclear power station, Concrete construction at Trawsfynydd .. .. .                                      | 307          |
| " Sizewell .. .. .   | 28, 215      |
| Office building at Croydon, A tall .. .. .   | 42           |
| " " Shepherd's Bush, An .. .. .  | 17           |
| " " in London, A newspaper .. .. .   | 227          |
| " of thirty-four storeys in London, An .. .. .   | 36           |
| Operatives and foremen, Training of .. .. .  | 293          |

## PATENT APPLICATIONS:

|   | PAGE               |
|---|--------------------|
| Concrete spacers .. .. .  | 52                 |
| Culverts and pipes .. .. .  | 234                |
| Curing concrete .. .. .   | 260                |
| Expansion joints .. .. .  | 204                |
| Floors .. .. .  | 52                 |
| Prestressed concrete .. .. .  | 234, 365           |
| " roofs .. .. .   | 407                |
| Reinforcement .. .. .   | 168                |
| Reinforcement .. .. .   | 52, 443            |
| Rail trusses .. .. .  | 407                |
| Runways and roads .. .. .   | 234                |
| Shuttering .. .. .  | 52, 166, 332       |
| Piers for the Tamar road bridge, Concrete .. .. .   | 130                |
| Piles, Forces in three-dimensional groups of, by W. E. Scriven .. .. .                                  | 371, 423           |
| " to penetration, Resistance of concrete .. .. .  | 70                 |
| Pipes with glass-fibre covering, Sewer .. .. .  | 193                |
| Plastic-hinge method, The analysis of three-bay frames by the, by K. Pookagasundram .. .. .             | 301                |
| Power station, Intake works at Basrah .. .. .   | 79                 |
| Precast construction of a silo at Belfast, Prestressed .. .. .  | 43                 |
| Precast members, Tests on joints in .. .. .   | 119                |
| <b>PRESTRESSED CONCRETE:</b>  |                    |
| Frame bridge at Cambridge .. .. .   | 281                |
| Hyperbolic tank on a chimney .. .. .  | 147                |
| Large transmission-line tower .. .. .   | 233, 339           |
| Long bridge in Germany .. .. .  | 90                 |
| Precast construction of a silo at Belfast .. .. .   | 43                 |
| Quay at Tees Dock .. .. .   | 413                |
| Recent developments in France .. .. .   | 135                |
| Standard beams .. .. .  | 200, 327           |
| Test-bed for engines .. .. .  | 69                 |
| Pricing reinforced concrete, 92, 136, 170, 296, 366, 408, 444 .. .. .                                   | 448                |
| Prize design .. .. .  | 488                |
| Quay at Tees Dock, Prestressed concrete .. .. .   | 413                |
| Railway structures, Concrete in recent .. .. .  | 179                |
| Ready-mixed concrete, A record supply of .. .. .  | 255                |
| " " " industry, Developments in the .. .. .   | 263                |
| " " " Vehicles for .. .. .  | 406                |
| " " " reckoners .. .. .   | 406                |
| Reinforced concrete sections, A practical comprehensive method of designing, by J. Rygol .. .. .        | 209, 247, 267, 323 |
| Reinforcement, in Great Britain .. .. .   | 49, 293            |
| Road, Improvements on the Great North .. .. .   | 5, 83              |
| Roof, A long-span suspended .. .. .   | 197                |
| " of Ashington technical college, Barrel-vault .. .. .  | 45                 |
| Roofs, Doubly-curved shell .. .. .  | 15                 |
| School, Extension to Llangollen Grammar .. .. .   | 25                 |
| Sewer pipes with glass-fibre covering .. .. .   | 193                |
| Shearing resistance of beams by the load factor method, The, by C. Erdel .. .. .                        | 315                |
| Shell research, Symposium on .. .. .  | 294                |
| " roofs, Doubly-curved .. .. .  | 15                 |
| Ship, A concrete .. .. .  | 246                |
| Shuttering for a helical stair, Glass-fibre .. .. .   | 167                |
| Silo at Belfast, Prestressed precast construction of a .. .. .  | 43                 |
| " " Gainsborough .. .. .  | 36                 |
| Siloes in Russia, Large sugar .. .. .   | 359                |
| Slabs for liquid-containing structures .. .. .  | 219                |
| " spanning in two directions, Balcony, by L. S. Müller .. .. .  | 239                |
| " The yield-line method of analysis of .. .. .  | 159                |
| Soils, Revised British standard for testing .. .. .   | 347                |
| Stair at West Hartlepool, A helical .. .. .   | 196                |
| " " Glass-fibre shuttering for a helical .. .. .  | 167                |
| Sulway in an existing building .. .. .  | 37                 |
| Swimming pool at Wythenshawe .. .. .  | 355                |
| Tank on a chimney, A prestressed hyperbolic .. .. .   | 147                |
| Tanks on elastic foundations, Bending moments on long rectangular, by J. D. Davies .. .. .              | 335                |
| Telecommunications centre, London .. .. .   | 245                |
| Temperature on tall slender columns, Effects of differential, by D. A. Stephenson .. .. .               | 175, 401           |
| Test-bed for engines, Prestressed .. .. .   | 69                 |
| Testing aggregates, Revised British standard for .. .. .  | 44                 |
| " bridges, A vehicle for .. .. .  | 361                |
| " soils, Revised British standard for .. .. .   | 347                |
| Tests on joints in precast members .. .. .  | 119                |
| Torres, Professor Eduardo, The works of the late .. .. .  | 385                |
| Tower, A large prestressed concrete transmission-line .. .. .   | 233, 329           |
| Towers, Large cooling .. .. .   | 29                 |
| " Tall reinforced concrete .. .. .  | 362                |
| Tunnel, A concrete-lined tube-railway .. .. .   | 217                |
| Turbine house at Skelton Grange, The new .. .. .  | 24                 |
| Viaduct, Uxbridge, Completion of Colne .. .. .  | 38                 |
| Wind on multiple-storey buildings, Position of planes of contraflexure due to, by P. M. Hewlett .. .. . | 57                 |
| Writing, Technical .. .. .  | 63, 331            |
| Yield-line method of analysis of slabs, The .. .. .   | 159                |

